



Heat waves in the United States: Mortality risk during heat waves and effect modification by heat wave characteristics in 43 U.S. communities

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Abstract:

BACKGROUND: Devastating health effects from recent heat waves, and projected increases in frequency, duration, and severity of heat waves from climate change, highlight the importance of understanding health consequences of heat waves. **OBJECTIVES:** We analyzed mortality risk for heat waves in 43 U.S. cities (1987-2005) and investigated how effects relate to heat waves' intensity, duration, or timing in season. **METHODS:** Heat waves were defined as \geq /Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 2 days with temperature \geq /Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 95th percentile for the community for 1 May through 30 September. Heat waves were characterized by their intensity, duration, and timing in season. Within each community, we estimated mortality risk during each heat wave compared with non-heat wave days, controlling for potential confounders. We combined individual heat wave effect estimates using Bayesian hierarchical modeling to generate overall effects at the community, regional, and national levels. We estimated how heat wave mortality effects were modified by heat wave characteristics (intensity, duration, timing in season). **RESULTS:** Nationally, mortality increased 3.74% [95% posterior interval (PI), 2.29-5.22%] during heat waves compared with non-heat wave days. Heat wave mortality risk increased 2.49% for every 1 degrees F increase in heat wave intensity and 0.38% for every 1-day increase in heat wave duration. Mortality increased 5.04% (95% PI, 3.06-7.06%) during the first heat wave of the summer versus 2.65% (95% PI, 1.14-4.18%) during later heat waves, compared with non-heat wave days. Heat wave mortality impacts and effect modification by heat wave characteristics were more pronounced in the Northeast and Midwest compared with the South. **CONCLUSIONS:** We found higher mortality risk from heat waves that were more intense or longer, or those occurring earlier in summer. These findings have implications for decision makers and researchers estimating health effects from climate change.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3040608>

Resource Description

Exposure : ☒

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature: ☒

Climate Change and Human Health Literature Portal



resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified